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(amended) Claims

1. A differential gear unit (100) which divides an input driving force into a first output and second output and permits a difference between a rotational speed of the first output and a rotational speed of the second output, and which includes a casing (120) that defines an internal space (120i) and an opening (120h) communicated with the internal space (120i) and that is rotatable in a given rotational direction (R1) and in a rotational direction opposite to the given rotational direction (R2), the casing (120) including an input portion (110) in which the driving force is input, **characterized in that**

the casing (120) is configured such that fatigue life of the casing (120) when the driving force is repeatedly input in the input portion (110) in the given rotational direction (R1) is longer than fatigue life of the casing (120) when the driving force is repeatedly input in the input portion (110) in the rotational direction opposite to the given rotational direction (R2), wherein

rotation in the given direction (R1) is rotation around a longitudinal axis of the differential gear casing (120),

wherein a dividing mechanism which is provided in the internal space (120i) and which divides the driving force into the first output and the second output; and a support member which is provided so as to contact the casing (120) and so as to support the dividing mechanism are further provided, wherein,

the dividing mechanism includes a pinion (143), and the support member includes a pinion shaft (141) which supports the pinion (143)

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such that the pinion (143) can rotate on its axis and which makes the pinion (143) revolve around a center of the casing (120),

wherein the fatigue life of the casing (120) is adjusted by making a shape of the opening (120h) asymmetrical with respect to a rotational axis (100a) of the casing (120), wherein

the opening (120h) is in a basically elliptical shape having a round shape at each of corner portions (121, 122, 123, 124), and the round shapes of the adjacent corner portions (121, 122, 123, 124) are different from each other, wherein

a curvature radius of the round shape of the corner portion (121, 123) of the opening (120h), where a tensile stress is generated when the driving force is input in the given rotational direction (R1), is larger than a curvature radius of the round shape of the corner portion (122, 124) of the opening (120h), where a compression stress is generated when the driving force is input in the given rotational direction (R1),

and wherein the fatigue life of the casing (120) is adjusted by performing heat treatment on a corner portion (121, 122, 123, 124) of the opening (120h) of the casing (120), wherein

heat treatment is performed on the corner portion (121, 123) of the opening (120h) of the casing (120), where a tensile stress is generated when the driving force is input in the given rotational direction (R1).

2. The differential gear unit according to claim 1, characterized in that

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the casing (120) includes a support portion which contacts the support member, and the fatigue life is measured by inputting the driving force in the input portion (110) without rotating the support portion.

3. The differential gear unit according to claim 1, **characterized in that**

the casing (120) includes an output portion (130) which is provided at a position that is different from a position of the support portion, and the fatigue life is measured by inputting the driving force in the input portion (110) without rotating the output portion (130).

4. The differential gear unit according to claim 1, **characterized in that**

the heat treatment includes at least one of induction hardening and carburizing treatment.

5. The differential gear unit according to any one of claims 1 through 4, **characterized in that**

the fatigue life of the casing (120) is adjusted by performing physical treatment on a corner portion (121, 122, 123, 124) of the opening (120h) of the casing (120).

6. The differential gear unit according to claim 5, **characterized in that**

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the physical treatment is performed on the corner portion (121, 123) of the opening (120h) of the casing (120), where a tensile stress is generated when the driving force is input in the given rotational direction (R1).

7. The differential gear unit according to claim 5 or 6, **characterized in that**

the physical treatment includes at least one of shot blasting and shot peening.